substrate surface at a temperature of 500 to 700°C, in a vacuum having a background pressure of less than approximately 10^{-11} Torr, and wherein the metal halide deposition is conducted at a rate permitting the metal halide vapor to react with the substrate surface to form a monolayer of metal atoms selected from barium atoms, strontium atoms, and cesium atoms, singly or in combinations thereof, on said surface of said substrate; and

continuing, after forming the monolayer, the vapor depositing of the metal halide to form a metal halide layer regime upon the monolayer until the desired barrier film thickness has been achieved.

16. (Amended) A process of making a semiconductor device according to claim 29, wherein the forming of the single crystal transition metal on the barrier film comprises depositing a transition metal on the barrier film concurrent with heating the substrate and barrier film surface to a temperature effective to cause the transition metal to assume a monocrystalline structure.

17. (Amended) A process for making a semiconductor device according to claim 29, wherein the forming of the

single crystal transition metal on the barrier film comprises the substeps of depositing a transition metal on the barrier film at a temperature below which the metal forms with a single crystal structure, and then annealing the resulting metallized substrate at a temperature effective to cause the transition metal to assume a monocrystalline structure.

18. (Amended) A process for making a semiconductor device according to claim 29, wherein the forming of the single crystal transition metal on the barrier film comprises depositing a transition metal on the barrier film concurrent with heating the substrate and barrier film surface to approximately 375 C or higher.

20. (Amended) A process for making a semiconductor device according to claim 29, wherein the forming of the single crystal transition metal on the barrier film comprises the substeps of depositing a transition metal on the barrier film at a temperature below 375 C, and then annealing the resulting metallized substrate at a temperature of 375 C or higher.

22. (Amended) A process for making a semiconductor device according to claim 29, wherein the barrier film comprises a homoepitaxial portion comprised a metal halide selected from barium halide, strontium halide, and cesium halide, located between the monolayer and the transition metal.

23. (Amended) A process for making a semiconductor device according to claim 29, wherein the homoepitaxial portion of the barrier film is selected from BaF_2, $BaCl_2$, SrF_2, $SrCl_2$, CsF, CsCl.

24. (Amended) A process for making a semiconductor device according to claim 29, wherein the barrier film has a thickness of less than 100Å.

25. (Amended) A process for making a semiconductor device according to claim 29, wherein the barrier film has a thickness ranging from approximately from 20Å to approximately 75Å.

26. (Amended) A process for making a semiconductor

device according to claim 29, wherein the transition metal is selected from the group consisting of copper, silver, gold and platinum.

27. (Amended) A process for making a semiconductor device according to claim 29, wherein the transition metal comprises copper.

28. (Amended) A process for making a semiconductor device according to claim 29, wherein the substrate material comprises a semiconductor.

Add new claim 29 as follows:

29. (New) A process of making a semiconductor device comprising the steps of: forming, on a surface of a substrate material, a barrier film; and forming a single crystal transition metal on the barrier film.